(12) UK Patent Application (19) GB (11) 2 175 812 A

(43) Application published 10 Dec 1986

(21) Application No 8514444

(22) Date of filing 7 Jun 1985

(51) INT CL⁴
A63B 23/04

(52) Domestic classification (Edition H):
A6M 8E1 8EY

(56) Documents cited
GB 1521473

(58) Field of search
A6M
Selected US specifications from IPC sub-class A63B

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# (54) Pedalling-type exerciser

(57) An exerciser comprises a pedal shaft (22) carried on a frame (10). The shaft carries a cam (26) and a flywheel (29) held fast with the shaft, and a cam follower (28) held in position by a cam follower locater (30). A flexible belt (48) is looped around the cam follower and urges the cam follower against the surface of the cam to apply a braking force thereon. The surface of the cam has at least one flat to periodically reduce the effective force applied by the cam follower. The flat is arranged to pass a lobe (46) on the cam follower when the pedal passes top dead centre to produce a smooth pedal action.

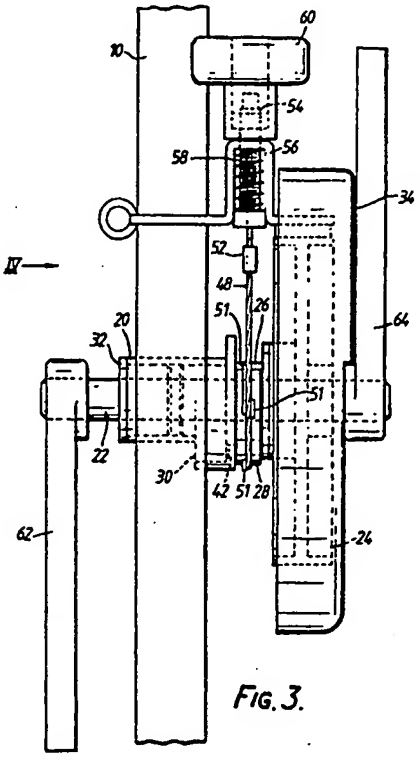


FIG. 3.

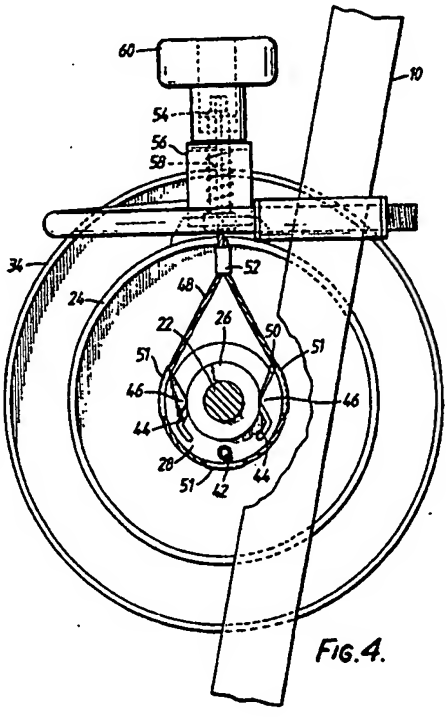


FIG. 4.

GB 2 175 812 A

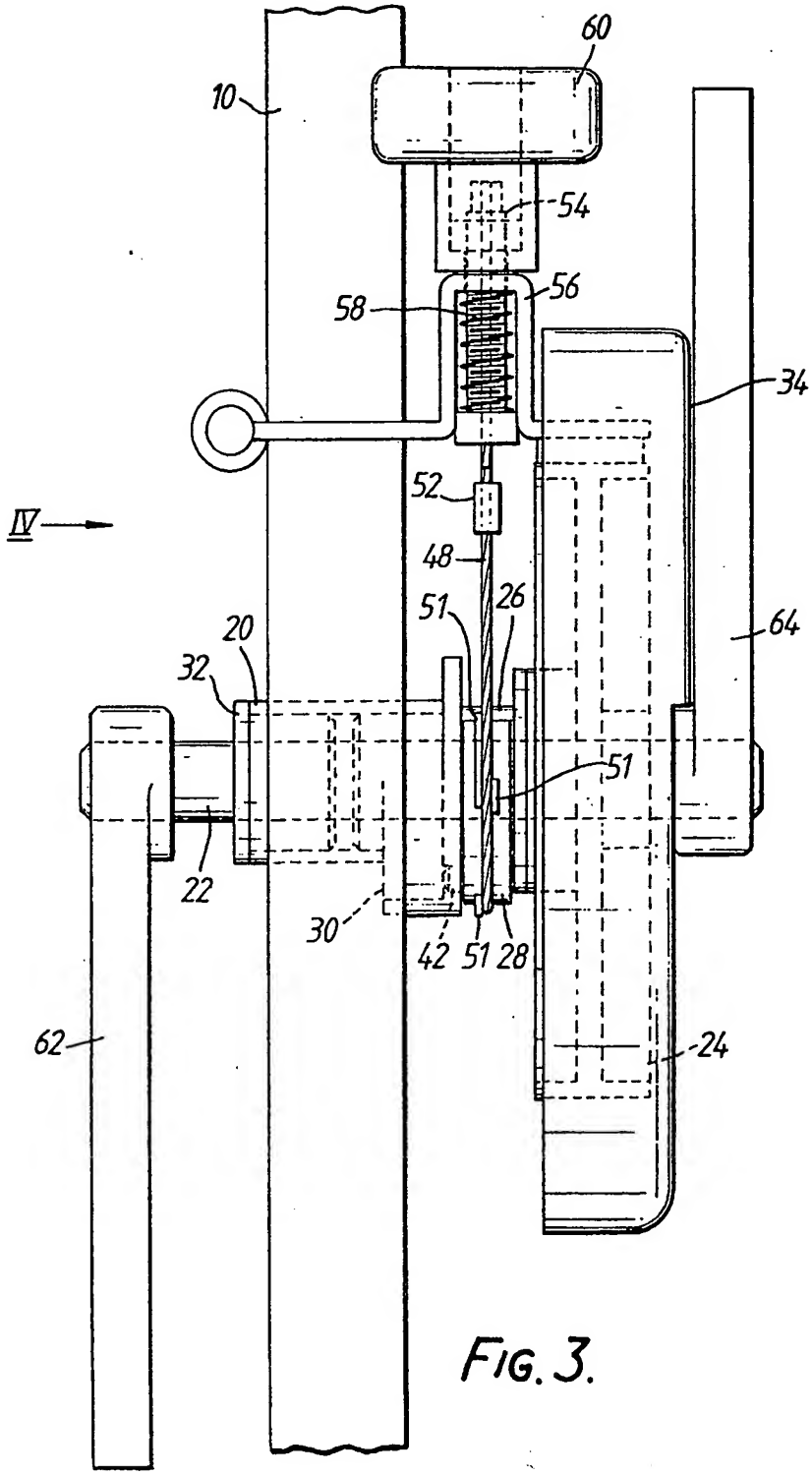


FIG. 3.

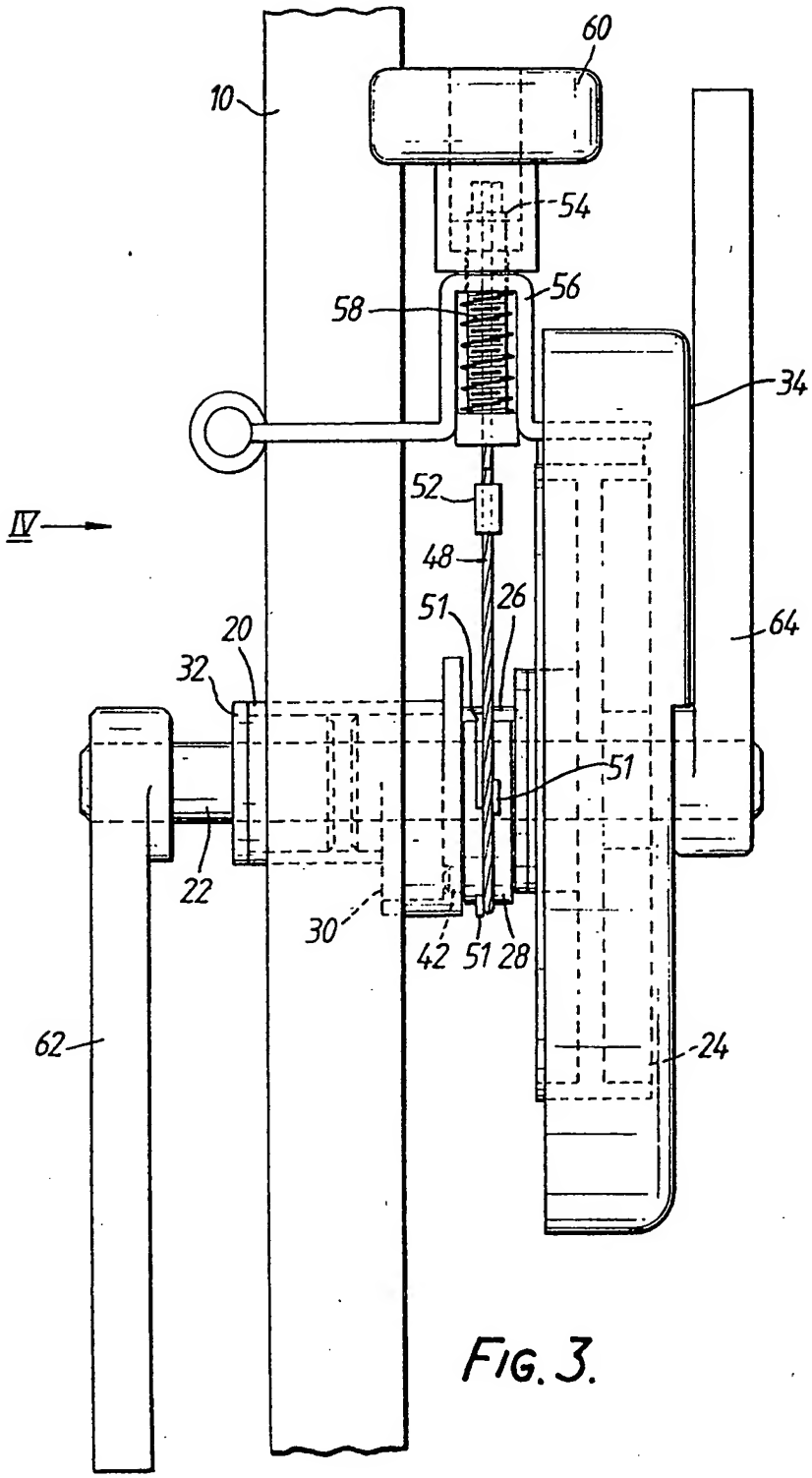


FIG. 3.

3/4

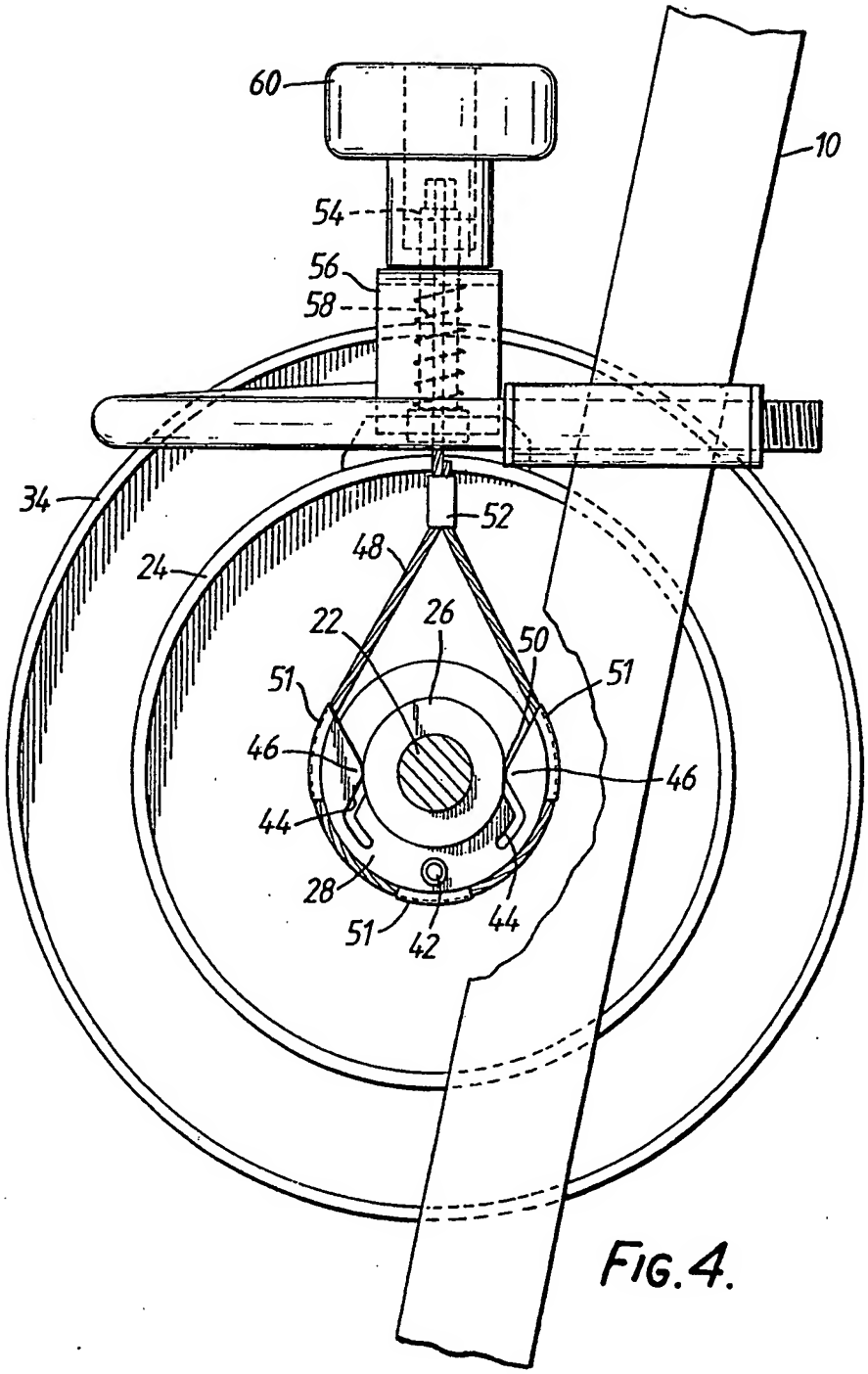


FIG. 4.

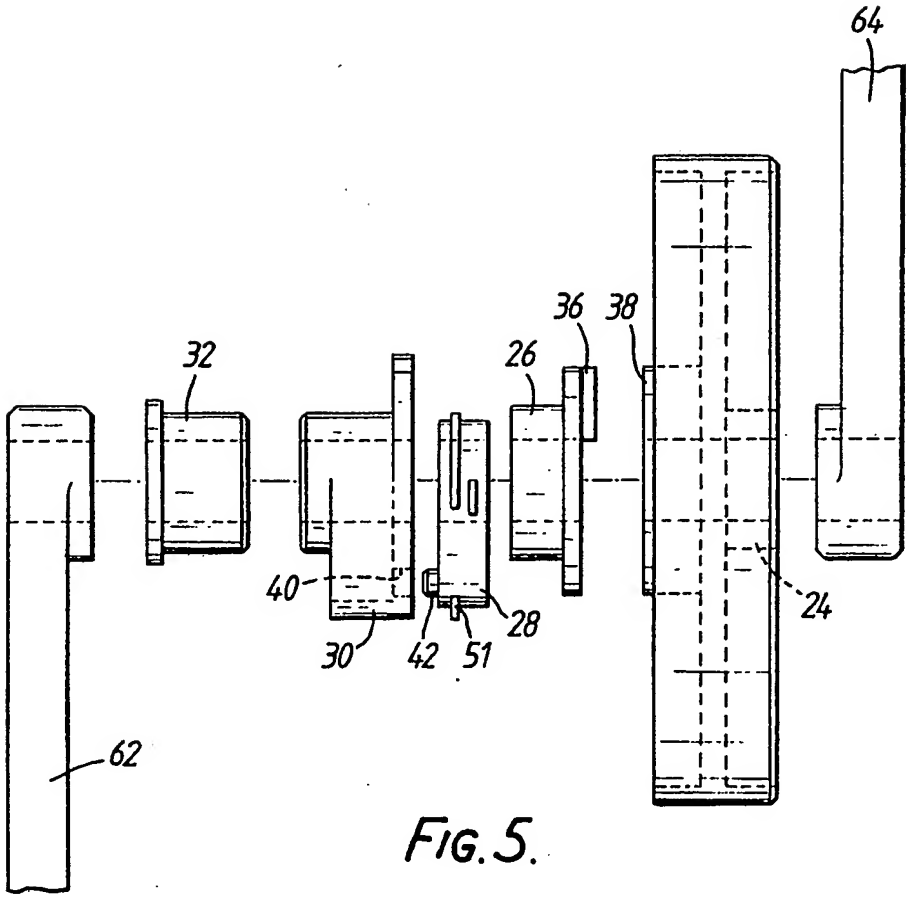


FIG. 5.

SPECIFICATION

## Exerciser

The present invention relates to static exercise machines, more specifically to such machines having a pedal mechanism.

Known pedal exercise machines provide a constant resistance but the user cannot apply a constant driving force since when one pedal passes top dead centre and the other passes bottom dead centre, the force exerted by the user's legs on the pedals is lower than at the remainder of the arc of revolution. This variation of force relative to constant resistance may be partially overcome by using a heavy flywheel. However this adds to the cost and weight of the exerciser and increases the force required at start up.

According to the present invention there is provided an exerciser comprising a pedal operable shaft, cam means fast with the shaft, follower means for applying a braking force to the cam means and resilient braking applicator means urging the follower means against the cam means, a portion of the cam surface being shaped to periodically reduce the effective force of the braking means.

A better understanding of the invention may be gained from the following description of a preferred embodiment, given by way of example only, in which reference is made to the accompanying drawings, wherein:

*Figure 1* is a side view of a static exerciser frame;

*Figure 2* is a rear view of the frame of Fig. 1;

*Figure 3* is a front view of the exerciser pedal mechanism;

*Figure 4* is a side view of the mechanism of Fig. 3, and

*Figure 5* is an exploded view of the pedal mechanism.

Figs. 1 and 2 show an exercise machine frame for receiving the mechanism of Figs. 3, 4 and 5. The frame comprises a member 10 attached at its lower end to a base member 12 provided with lateral support legs 14, 16, and its upper end telescopically receiving an adjustable seat and handle part 18. A pedal shaft will be received in a bearing sleeve 20.

Turning now to Figs. 3, 4 and 5, pedal shaft 22 carries fast with it a flywheel 24, and a cam 26, the latter having an associated cam follower 28. A shaft bearing cum cam follower locater 30 and a shaft bearing 32 are received in sleeve 20 and themselves receive the shaft. Flywheel 24 has a cover 34 secured to the flywheel. The cam 26 and flywheel 24 are held against relative rotation by a key 36 and keyway 38 as shown in Fig. 5, while bearing cum cam follower 30 is held against rotation by member 10 and itself holds cam follower 28 against rotation by means of a lower.

Cam follower 28, as can be seen in Fig. 4, is an annular segment provided with two slots 44 which render the segment resilient whereby lobes 46 are radially movable relative to cam 26 and are biased radially inwardly by a flexible belt 48 e.g. a wire cable. The periphery of cam 26 has a flat 50 which when passing a lobe reduces the braking force applied by the lobe.

Belt 48 defines a loop, passing around the cam follower between guides 51, a collar 52 clamping free end of the belt to a mid part of the belt to define the loop while the other end is anchored on a threaded stem 54 received non-rotatably by a bracket 56 mounted on the frame. A spring 58 biases the stem towards the cam follower against the action of an adjuster 60 threaded on the stem and bearing, as does spring 58 on the bracket.

Shaft 22 has pedal cranks 62 and 64, to each of which a pedal is attached. Flat 50 of cam 26 is set to pass a lobe as a pedal passes top dead centre, whereby the resistance preset by cam follower 28 on cam 26 is reduced where the force exerted by the user is at a minimum providing a smoother pedal action.

Flat 50 is defined preferably as an arc of a greater radius of curvature than the rest of the cam periphery. Two flats positioned diametrically opposite may be provided as an alternative.

CLAIMS

1. An exerciser comprising a pedal operable shaft, cam means fast with the shaft, follower means for applying a braking force to the cam means and resilient braking applicator means for urging the follower means against the cam means, a portion of the surface of the cam means being shaped to periodically reduce the effective force of the braking means.

2. An exerciser according to claim 1 wherein the effective force reducing portion of the surface of the cam means comprises a flat having an arc of greater radius of curvature than the rest of the cam surface.

3. An exerciser according to claim 1 or 2 wherein a further effective force reducing portion of the surface of the cam means is located diametrically opposite said portion.

4. An exerciser according to any preceding claim wherein the cam follower means is held in position by a cam follower locater mounted on the pedal shaft and held against relative rotation with the cam follower means.

5. An exerciser according to any preceding claim wherein the resilient braking applicator means comprises a belt defining a loop around the cam follower means urging the cam follower means against the cam means.

6. An exerciser according to claim 5

to vary the pressure exerted on the cam means by the cam follower means.

7. An exerciser according to any preceding claim wherein the cam follower means is a resilient annular segment having lobes on the inner surface thereof for engaging the surface of the cam means.

8. An exerciser according to claim 7 wherein the annular segment has guides on the outer surface thereof for positioning the braking applicator means.

9. An exerciser according to any preceding claim wherein a flywheel is held fast with the shaft, the flywheel being held against relative rotation with the cam means.

10. An exerciser substantially as herein described with reference to the accompanying drawings.

Printed in the United Kingdom for
Her Majesty's Stationery Office, Dd 8818935, 1986, 4235.
Published at The Patent Office, 25 Southampton Buildings,
London, WC2A 1AY, from which copies may be obtained.